

## APPENDIX A

### Sequence Comparison — Mouse vs. Human TERT

#### Mouse TERT protein sequence

LOCUS 070372 1122 aa linear ROD 15-JUN-2002  
 DEFINITION Telomerase reverse transcriptase (Telomerase catalytic subunit).  
 ORGANISM Mus musculus  
 AUTHORS Greenberg,R.A., Allsopp,R.C., Chin,L., Morin,G.B. and DePinho,R.A.  
 TITLE Expression of mouse telomerase reverse transcriptase during  
 development, differentiation and proliferation  
 JOURNAL Oncogene 16 (13), 1723-1730 (1998)

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1 mtraprccpav rsllrsryre vwplatfvrr lgpegrrlvq pgdpkiyrtl vaqclvcmhv
61 gsqpppadls fhqvsslkel varvvqr lce rnernvlafg fellneargg ppmaftssvr
121 sylpntviet lrvsgawml lsrvgddl v yllahcalyl lvppscayqv cgsplyqica
181 ttdiwpvsva syrptrpvgr nftnlrflqq iksssrqcap kplalpsrgt krhlsltsts
241 vpsakkarcy pvrprveegph rqlvptpsgk swvpsparsp evptaekdls skgkvsdls
301 sgsvcckhkp sstslsppr qnafqlrpf i etrhflysrg dgqerlnpsf llsnlqpnlt
361 garrlveiif lgsrprtsqp lcrthrlsrr ywqmrplfq llvnhacqy vrlrshcrf
421 rtanqqvtda lntspplmd lrlhsspwq vygflraclc kvvsaslwgt rhnerrffkn
481 lkkfislgyk gklslqelmw kmkvedchw l rsspdkdrvp aaehrlreri latflfwlmd
541 tyvvqllrsf fyitestfqq nrlffyrksv wsklqsigvr qhlervlre lseqevrhhq
601 dtwlampicr lrfipkpngr rpivnmsysm gtralgrkq aqhftqrlkt lfsmlnyert
661 khphlmgsav lgmndiyrtw rafvlrvra l dqtprmyfvk advtgaydai pggklvevva
721 nmirhsesty cirqyavvrr dsqqgvhksf rrqvttlsdl qpymgqflkh lqdsdasalr
781 nsvieqsis mnesssslfd fflhflrhsv vkigdrctyq cqgipqgssl stllcslcfcg
841 dmenklfaev qrdglllrfv ddfllvtphl dqaktflstl vhgvpaygcm inlqktvvnf
901 pvepgtlgga apyqlpahcl fpwcgllldt qtlevfcdys gyaqtsikts ltfqsvfkag
961 ktmrnklsv lrlkchglf l dlqvnslqt v ciniykifl qayrfhacvi qlpfdqrvrk
1021 nltfflgiis sqasccyail kvknpgmtlk asgsfppeaa hwlcyaqall klaahsviyk
1081 cllgplrtaq klcrklpea tmtilkaaad palstdfqti ld
  
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#### Human TERT protein sequence

LOCUS 014746 1132 aa linear PRI 15-JUN-2002  
 DEFINITION Telomerase reverse transcriptase (Telomerase catalytic subunit)  
 ORGANISM Homo sapiens  
 AUTHORS Nakamura,T.M., Morin,G.B., Chapman,K.B., Weinrich,S.L.,  
 Andrews,W.H., Lingner,J., Harley,C.B. and Cech,T.R.  
 TITLE Telomerase catalytic subunit homologs from fission yeast and human  
 JOURNAL Science 277 (5328), 955-959 (1997)

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1 mpraprccrav rsllrshyre vlplatfvrr lpgqgwrlvq rgdpaafral vaqclvcvpw
61 darpppaaps frqvscikel varvlqr lce rgaknvlafg falldgargg ppeaftssvr
121 sylpntvtda lrgsgawgl lrrvgddlv hllarcalfv lvapscayqv cgplyqlga
181 atqarpppha sgprrrlgce rawnhsvrea gvplglpapg arrrggsasr slplpkprrr
241 gaapeperrp vggswahpg rtrgpsdrgr cvvsparpae eatslegals gtrhshpsvg
301 rqhahagpst srpprpwdtp cppvyaetkh flyssgkdeq lrpsfllssl rpsltgarri
361 vetiflgsrp wmpgtprrrl rlpqrywqmr plflellgnh aqcpygvllk thcplraavt
421 paagvcarek pqgsvaapee edtdprrlvq llrqhsspwq vygfvraclr rlvpplwgs
481 rhnerrflrn tkkfislghk aklsiqeltw kmsvrdcawl rrspgvgcvp aaehrlreei
541 lakflhlwms vyvvellrsf fyvtettfqq nrlffyrksv wsklqsigir qhlkrvqlre
601 lseaevqrhr earpalltsr lrfipkpdgl rpivnmdivv gartfrrekr aerltsrvka
661 lfsvllyera rrppllgasv lglddihrav rtfvlrvraq dppelyfvk vdtgaydti
721 pqdrltevia siikpntyc vrryavvqka ahghvrkafk shvstltdlq pymrqfvahl
781 qetsplrdav vieqssslne assglfdvfl rfmchhavri rgksyvcqcg ipqgsilstl
841 lcslycdgme nkifagirrd gllrlvddf llvtphltha ktflrtlvrq vpeygcvnvl
901 rktvvnpvpe dealggtafv qmpahglfpw cgllldtrtl evqsdysy rtsirasltf
961 nrgfkagrnm rrlfgvlrl kchslfldlq vnsltqvctn iykilllqay rfhacvlqlp
1021 fhqqvwknpt flrlvisdta slcysilkak nagmslgakg aagplpseav qwlchqafl
1081 kltrhrvtv pllgsrlrtaq tqlsrklpgt tltaleaaan palpsdfkti ld
  
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## Sequence Comparison

Performed at the following website:  
<http://www.ncbi.nlm.nih.gov/blast/bl2seq/bl2.html>

Score = 1340 bits (3468), Expect = 0.0  
Identities = 715/1146 (62%), Positives = 839/1146 (72%), Gaps = 38/1146 (3%)



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mouse: 1   MTRAPRCPAVRSLLRSRYREVWPLATFVRRLLGPEGRRLVQPGDPKIYRTLVAQCLVCMHW 60
          M RAPRC AVRSLLRS YREV PLATFVRRLLGP+G RLVQ GDP +R LVAQCLVC+ W
human: 1   MPRAPRCRAVRSLLRSHYREVLPLATFVRRLLGPQGWRLVQRGDPAAFRALVAQCLVCPV 60

mouse: 61   GSQPPPADLSFHQVSSLKELVARVVQRLCERNERNVLAFGFELLNEARGGPPMAFTSSVR 120
          ++PPPA SF QVS LKELVARV+QRLCER +NVLAFGF LL+ ARGGPP AFT+SVR
human: 61   DARPPPAAPSFRQVSLKELVARVLQRLCERGAKNVLAFGFALLDGARGGPPEAFTTSVR 120

mouse: 121  SYLPNTVIETLRVSGAWMLLSRVGDDLLVYLLAHCALYLLVPPSCAYQVCGSPLYQICA 180
          SYLPNTV + LR SGAW LLL RVGDD+LV+LLA CAL++LV PSCAYQVCG PLYQ+ A
human: 121  SYLPNTVTDALRGSGAWGLLLRRVGDVLLVHLLARCALFVLVAPSCAYQVCGPPLYQLGA 180

mouse: 181  TTDIWPSVSASYRPTRPVGRNFTNLRFLQKIKSSSRQEAPKPLALPSRGTKRHLSLTSTS 240
          T P AS P R +G ++ + S +EA PL LP+ G +R S S
human: 181  ATQARPPPHAS-GPRRRLG-----CERAWNHSVREAGVPLGLPAPGARRRGGASRS 231

mouse: 241  VPSAKKARCYPVPRVEEGPHRQVLPTPSGKSWVSPAR----SPEVPTAEKDLSSKGKVS 296
          +P K+ R P E P Q G++ PS SP P AE+ S +G +S
human: 232  LPLPKRPRRGAAPEPERTPVGQGSWAHPGTRGPSDRGFCVVSPARP-AEEATSLEGALS 290

mouse: 297  DLSLSG-SVCCCHKPSSTSLLSPPRQNAFQLRP-FIETRHFYLSRGDQGERLNPSFLLSN 354
          S SV +H S PPR P + ET+HFLYS GD +E+L PSFLLS+
human: 291  GTRHSHPSVGRQHHAGPPSTSRPPRPWDTPCPPVAETKHFYSSGD-KEQLRPSFLLSS 349

mouse: 355  LQPNLTGARRLVEIIFLGSRPRTSGPLCRTHRLSRRYQMRPLFQQLLVNHAECQYVRL 414
          L+P+LTGARRLVE IFLGSRP G R RL +RYWQMRPLF +LL NHA+C Y LL
human: 350  LRPSLTGARRLVETIFLGSRPWMPGTPRRLPRLPQRYWQMRPLFLELLGNHAQCPYGVLL 409

mouse: 415  RSHCRFTA-----NQVTDALNTSPPHMDLLRLHSSPWQVYGFRLACL 459
          ++HC R A + + +T P L+ LLR HSSPWQVYGF+RACL
human: 410  KTHCPLRAAVTPAAGVCAREKPGGSVAAPPEEDTPRRLVQLLRQHSSPWQVYGFVRACL 469

mouse: 460  CKVVSASLWGTRHNERRFFKNLKKFISLGKGLSLQELMWMKMKVEDCHWLRSSPGKDRV 519
          ++V LWG+RHNERRF +N KKFISLGK+ KLSLQEL WKM V DC WLR SPG V
human: 470  RRLVPPGLWGSRHNERFLRNTKKFISLGKHAKLSLQELTWKMSVRDCAWLRRSPGVGCV 529

mouse: 520  PAAEHLRERILATFLFWLMDTYVVQLLRSFFYITESTFQKNRLFFYRKSVWSKLQSIGV 579
          PAAEHLRRE ILA FL WLM YVV+LLRSFFY+TE+TFQKNRLFFYRKSVWSKLQSIG+
human: 530  PAAEHLRREEILAKFLHWMVSVYVVELLSFFYVTETTFQKNRLFFYRKSVWSKLQSIGI 589

mouse: 580  RQHLERVRLRELSQEEVRHHQDTWLAMPICRLRFIPKPNGLRPINMSYSMGTRALGRRK 639
          RQHL+RV+LRELS+ EVR H++ A+ RLRFPKP+GLRPINM Y +G R R K
human: 590  RQHLKRVQLRELSEAEVRQHREARPALLTSRLRFIPKPDGLRPINMDYVVGARTFRREK 649

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mouse: 640 QAQHFTQRLKTLFSLNRYERTKHPHLMGSSVLGMNDIYRTWRAFLRVLRALDQTPRMVYV 699  
+A+ T R+K LFS+LNYER + P L+G+SVLG++DI+R WR FVLRVRA D P +YFV  
human: 650 RAERLTSRVKALFSVLNRYERARRPGLLGASVLGLDDIHRAWRTFVLRVRAQDPPPELYFV 709

mouse: 700 KADVTGAYDAIPQGLVEVVANMIRHSESTYCIQYAVVRRDSQGVHKSFRRQVTTLS 759  
K DVTGAYD IPQ +L EV+A++I+ ++TYC+R+YAVV++ + G V K+F+ V+TL+D  
human: 710 KVDVTGAYDTIPQDRLTEVIASIIK-PQNTYCVRRYAVVQKAAHGHVRKAFKSHVSTLTD 768

mouse: 760 LQPYMGQFLKHLQDSDASALRNSVVEIQSISMNESSSLDFDLHFLRHSVVKIGDRCYT 819  
LQPYM QF+ HLQ++ S LR++VVIEQS S+NE+SS LFD FL F+ H V+I + Y  
human: 769 LQPYMRQFVAHLQET--SPLRDAVVIEQSSSLNEASSGLFDVFLRFMCHHAVRIRGKSYV 826

mouse: 820 QCQGIPOGSSSLTLLCSLCFGDMENKLF AEVQRDGLLLRFVDDFLLVTPHLDQAKTFLST 879  
QCQGIPOGS LSTLLCSLC+GDMENKLF ++RDGLLLR VDDFLLVTPHL AKTFL T  
human: 827 QCQGIPOGSILSTLLCSLCYGD MENKLFAGIRRDGLLLRLVDDFLLVTPHLTHAKTFLRT 886

mouse: 880 LVHGVPEYGC MINLQKT VVNFVPEPGLGGAAPYQLPAHCLFPWCGLLLDQTLEVFCDY 939  
LV GVPEYGC++NL+KTVVNFVPE LGG A Q+PAH LFPWCGLLLD+TLEV DY  
human: 887 LVRGVPEYGC VVNLKTVVNFVPEDEALGGTAFVQMPAHGLFPWCGLLLDTRTLEVQSDY 946

mouse: 940 SGYAQTSIKTSLTFQSVFKAGKTMRNKLLSVLRKCHGLFLDLQVNSLQTVCTINIYKIFL 999  
S YA+TSI+ SLTF FKAG+ MR KL VLRLKCH LFLDLQVNSLQTVCT NIYKI L  
human: 947 SSYARTSIRASLTFNRGFKAGRMRRKLFGLRLKCHSLFLDLQVNSLQTVCTNIYKILL 1006

mouse: 1000 LQAYRFHACVIQLPFDQRVRKNLTFGLGISSQASCCYAILKVKNPGMTLKASGS---FP 1056  
LQAYRFHACV+QLPF Q+V KN TFFL +IS AS CY+ILK KN GM+L A G+ P  
human: 1007 LQAYRFHACVLQLPFHQVWKNPTFFLRVISDTASLCYSILKAKNAGMSLGAKGAAGPLP 1066

mouse: 1057 PEAHWLCYQAFLLKLAH SVIYKCLLGLR TAQKLLCRKLPEATMTILKAAADPALSTD 1116  
EA WLC+QAFLLKL H V Y LLG LRTAQ L RKLP T+T L+AAA+PAL +D  
human: 1067 SEAVQWLCHQAFLLKLTRHRTYVPLLGLSLRTAQQLSRKLP GTTLTALEAAAANPALPSD 1126

mouse: 1117 FQTILD 1122  
F+TILD  
human: 1127 FKTILD 1132